

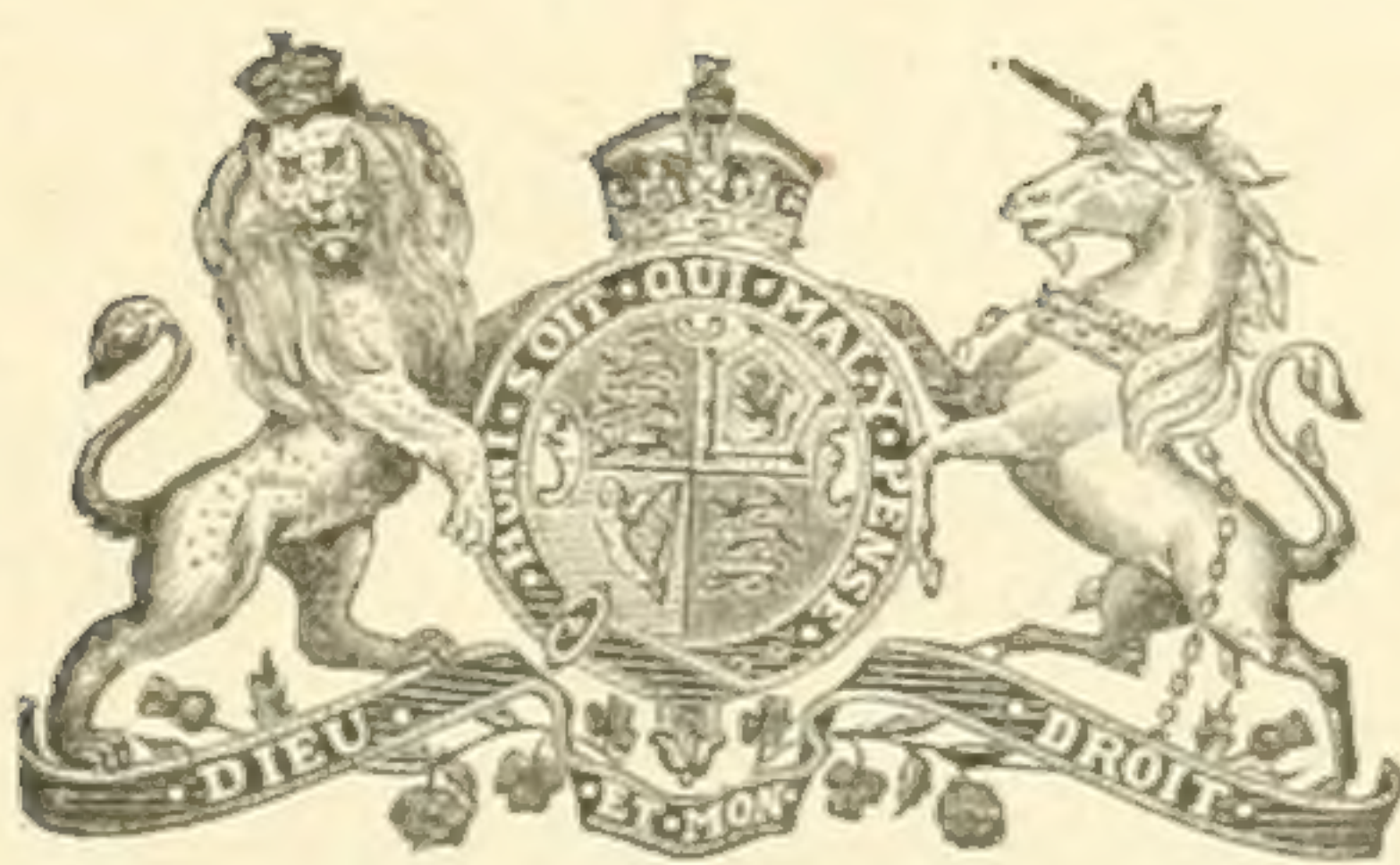
SUPPLEMENTARY REPORT

OF THE

INTERNATIONAL WATERWAYS COMMISSION

1908

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1908

[No. 19c—1908.]

TORONTO, ONTARIO, June 23, 1908.

To the Honourable the Secretary of State of the United States of America

and

The Honourable the Minister of Public Works of the Dominion of Canada.

The International Waterways Commission has the honour to submit the following report and preliminary estimate upon the work prescribed to it by article 4 of the Treaty of April 11, 1908, relating to the more complete definition and demarcation of the international boundary between the United States and the Dominion of Canada.

1. The commission has decided that the series of charts be uniform in size.

That a scale of 1:20,000 be adopted for the delineation of the rivers and Pigeon bay; that the head of the St. Lawrence river and foot of Lake Ontario, the east and west ends of Lake Erie, Lake St. Clair, False Detour passage and the east end of Lake Superior (Whitefish bay) be delineated on a scale of 1:60,000; that lakes Ontario, Erie, Huron and Superior be delineated on a scale of 1:300,000; and that the Niagara river from Lewiston to La Salle, and the St. Mary's river from Little Rapids to Point aux Pins, be also delineated on a larger scale of 1:10,000.

The standard size of these charts to be 40 by 50 inches within the border.

Based upon the foregoing, there will be required:—

7	charts	for the St. Lawrence river.
2	"	" Lake Ontario.
2	"	" Niagara river.
3	"	" Lake Erie.
2	"	" Detroit river.
1	chart	" Lake St. Clair.
2	charts	" the St. Clair river.
2	"	" Lake Huron.
4	"	" St. Mary's river.
3	"	" Lake Superior.
1	chart	on 1:10,000 for Niagara falls.
1	"	" St. Mary's falls.

Total 30

That these charts be projected upon the new United States standard datum, and show substantially the following:—

The shore line of the lakes, rivers, islands and the mouths of the more important tributary streams; the location of all the principal cities and towns; the location of all lighthouses, and all permanent aids to navigation; and all of the hydrography available from the Canadian and United States surveys; all of the geographic positions upon which the projections are based; the boundary line, and all monuments, ranges, buoys, &c., used to mark it.

Our reasons for the foregoing recommendations are based upon a careful study of the lake survey charts. It was found that a series of charts based upon two scales, one for the lakes and one for the rivers, would not satisfy all of the conditions. Three

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scales, namely, 20, 60 and 300 thousand, cover every feature of the boundary in a fairly satisfactory manner, with the possible exception of the immediate localities of Niagara falls and the St. Mary's falls. For these localities, where large power interests are located, we have adopted a chart for each on a scale of 1:10,000. It is possible that there may be other localities where, after further consideration, it may be advisable to delineate them on a scale of 1:10,000 also. It should be understood that these charts on this scale are to be extras; that is, they will cover areas that will be delineated on the smaller scale charts. It will be seen at a glance that this method would be much cheaper than to produce all of the river charts on a scale of 1:10,000.

One of the difficulties of producing all of the river charts on a scale of 1:10,000 is that in certain localities they would not show enough of the territory adjacent to the river to permit of showing permanent marks and ranges.

2. Having, as above, determined upon the most suitable scales for the proposed charts, there naturally follows the question of production, not only for delineating the boundary line, but for fulfilling the terms of the treaty by making four copies for the files of the two governments.

For the charts, the commission is of the opinion that the surveys of the United States lake survey can be safely taken, as they embrace all the United States shores and much of the Canadian, and that most of the missing portions of the latter can be filled in from the work of the Canadian hydrographic survey.

The majority of the charts of the United States lake survey now in use were constructed prior to the connection between its triangulation and that of the coast and geodetic survey, from which was derived the United States standard datum, and as a consequence these charts are not in accord with that datum.

In our opinion it would be quite improper for an international commission engaged in such an important work as the delineation of a boundary line, to offer the public of two countries any charts not drawn from the latest information available.

It therefore becomes necessary to construct new charts for the special purpose upon nearly uniform scales.

The charts called for may be produced in three ways:—

- (a) By draughting on paper;
- (b) By photolithography, and
- (c) By engraving.

(a) *By draughting.*—In this method, the projection, reduction and drawing must be all carefully drawn on paper, and from the finished sheet, four separate copies would be taken singly and independently. This process would be very laborious and costly, and would leave infinite chances for inaccuracies, inconsistencies and omissions, to such an extent that it would be almost impossible to assert that any two copies were exactly alike. In addition, most of the accuracy obtained from redrawing would be sacrificed in the various necessary transfers.

(b) *By photolithography.*—In this method one copy must be most carefully and neatly drawn in every particular for the photographer. The commission does not feel that it would be justified in adopting this method, because of the distortion that usually accompanies the use of photography.

(c) *By engraving.*—There are two kinds of engraving usually practiced in the production of charts, that upon stone and that upon copper, the former being cheaper and more expeditious.

In this process the projection can be accurately drawn upon the stones, and the details of shore-line, hydrography, &c., placed directly there by reducing from the originals either by pantagraph or photography without any necessity for a finished drawing. The commission has adopted this method of reproduction, because upon the stone the chart can be drawn more accurately than upon paper, and from this *any number* of charts can be printed immediately, each one exactly like all the others.

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In addition, if thought advisable, the charts can be preserved on these stones for all time; or they can be transferred to copper by the process now used by the lake survey, the copper plates preserved and the stones sold.

An approximate estimate of the chart work by this method would be \$60,000.

3. Field work required for the preparation of charts:—

In the construction of charts for navigation purposes the two governments have been engaged for several years. The survey of the United States shores has been completed in conjunction with a primary triangulation that extends into Canada in many places. Of the Canadian shores, those of lakes Huron and Erie have been completed, while that of Lake Superior is partially done, and wherever possible, connection has been made with the triangulation of the United States lake survey, so that the two surveys may be taken as giving an accurate delineation of the outline of the lakes. For an accurate determination of the boundary line there remains to be surveyed the whole of the north shore of Lake Ontario from False Ducks to Port Dalhousie, a portion of Lake Superior in the vicinity of Otter Head, and a resurvey of Pigeon bay on a larger scale than has been used by the Canadian hydrographic survey.

4. Placing monuments, ranges, buoys, &c., to mark the boundary:—

The treaty calls upon the commission to mark the international boundary by monuments, ranges, buoys, &c., wherever possible. The cost of this work will depend upon the number and character of marks established, but a rough estimate would be \$100,000, making an approximate total estimate for doing the work of \$160,000.

A probable estimate for expenditures the first year is \$15,000 for each government. All of which is respectfully submitted.

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Secretary, Canadian Section.

W. EDWARD WILSON,
Secretary, American Section.

